DOSING CLOSURE AND METHOD OF USING

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention broadly relates to the field of packaging, and more specifically relates to a portion closure that is adapted to release a substance into a container.

2. Description of the Related Technology

Many substances that are in wide commercial use are able to be concentrated by the manufacturer and later reconstituted by the consumer by mixing the concentrated with water. It is often ecologically preferable to use concentrates rather than paying the economic and social costs of transporting the bulkier final product through the distribution chain to the consumer. In addition, concentrates tend to have a longer shelf life than the unconcentrated product. Accordingly, many products are already being sold in concentrated form, with a variety of different structures having been advanced for mixing and reconstituting the concentrate into the final product.

One disadvantage of using a concentrate is that the consumer will often end up with the concentrate or the final product on his or her hands, which in some cases may be unpleasant or unhealthy, or the concentrate, the water or the final product may be spilled on to other surfaces. A need exists for a portion closure that provides a safe and convenient way to dispensing a concentrate into a container without the concentrate ever coming into direct contact with the consumer or the surrounding environment.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the invention to provide a portion closure that provides a safe and convenient way to dispensing a concentrate into a container without the concentrate ever coming into direct contact with the consumer or the surrounding environment.

In order to achieve the above and other objects of the invention, a system for dispensing a substance into a container includes a closure main body having a top portion and a downwardly depending sidewall portion that is adapted to be secured to a container; vial securing structure for securing to the closure main body a modular sealed vial that contains a substance; and unsealing structure for unsealing the sealed vial when the closure is secured on to the container.

According to a second aspect of the invention, a dispensing container assembly includes a container having a threaded finish portion; at least one modular sealed vial that contains a substance; and a closure cap including a closure main body having a top portion and a downwardly depending sidewall portion that is adapted to be secured to a container; and vial securing structure for securing the modular sealed vial; and an insert positioned between the closure cap and the container for unsealing the sealed vial.

According to a third aspect of the invention, a method of dispensing a substance into a container includes steps of securing a sealed modular vial between a container and a closure cap; and unsealing the modular vial by screwing the closure cap onto the container.

These and various other advantages and features of novelty that characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages, and the objects obtained by its use, reference should be made to the drawings which form a further part hereof, and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is an exploded fragmentary perspective view of a system that is constructed according to a preferred embodiment of the invention; and

FIGURE 2 is a fragmentary cross-sectional view of a dispensing container assembly according to the preferred embodiment of the invention, shown in a first operational position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

Referring now to the drawings, wherein like reference numerals designate corresponding structure throughout the views, and referring in particular to FIGURE 1, a system 10 for dispensing a substance into a container when combined with a container 14 forms a dispensing container assembly 12, which is illustrated in FIGURE 2. Referring again to FIGURE 2, container 14 includes a finish portion 16 having a plurality of external threads 18, as is conventional. Dispensing container assembly 12 further includes a modular sealed vial 20 that is generally cylindrical in shape and that contains a substance that is intended to be mixed with the contents of the container 14. A closure 22 that is configured to be able to screwed on to the finish portion 16 of the container 14 includes a closure main body 24 having a top portion 26 and a downwardly depending sidewall portion 28. The downwardly depending sidewall portion 28 has a plurality of internal threads 30 molded therein that are shaped and sized to mesh with the threads 18 that are provided on the finish portion 16 of the container 14.

As is shown in FIGURE 2, vial securing structure 32 is provided on the closure 22 for securing the modular sealed vial 20 to the underside of the closure 22. In the preferred embodiment, vial securing structure 32 is configured as a downwardly projecting annular cylindrical projection that is concentrically positioned within the closure 22 and that is integrally molded to the underside of the top portion 26 of the closure 22.

Dispensing container assembly 12 further preferably includes an insert member 34 that is positioned between the container 14 and the closure 22 for unsealing the sealed modular vial

20. The sealed modular vial 20 preferably has an open bottom end that is sealed by a frangible membrane 36, which is preferably a foil laminate that is sealed to the cylindrical body of the vial 20. As may best be seen in FIGURE 1, an outwardly projecting annular ring 38 is molded into the vial 20, as is a longitudinally extending rib 40 that is positioned near the upper end of the vial 20. Annular ring 38 is adapted to snapped into a mating annular recess 44 that is defined in the cylindrical projection 42 of the vial securing structure 32. Longitudinal rib 40 is adapted to fit into a mating groove 41 that is also defined in the cylindrical projection 42 of the vial securing structure 32. The purpose of the coupling of the annular ring 38 and the annular recess 44 is to keep the vial 20 positioned snugly within the vial securing structure 32. The purpose of the coupling of the longitudinal rib 40 and the recess 41 is to keep the vial 20 from rotating relative to the closure cap 22 during operation. This ensures that the vial 20 will turn together with the closure cap 22 as the closure cap 22 is screwed onto the container 14.

As is best shown in FIGURE 1, insert 34 has a lip portion 46 that is shaped to fit securely over the end of the finish portion 16 of the container 14. This keeps the insert 34 precisely located with respect to the container 14. Insert 34 further preferably includes an upward projection 47 that terminates in a sharp point or tip 48, and a plurality of radial projections 50 that extend radially outwardly from the projection 47. A passageway 52 is further defined in the lower portion of the insert 34 for permitting the material from within the breached vial 20 to flow downwardly into the container 14 after opening.

The consumer will insert the vial 20 into the vial securing structure, and will then screw the closure cap 22 on to the container 14. As this occurs, the tip 48 of the projection 47 will penetrate and breach the membrane 36 of the vial 20, and as the vial continues to rotate with respect to the projection 47 as the closure cap 22 continues to be turned, the radial projections 50 will further tear the membrane further open, thus permitting even more of the substance within the vial 20 to escape through the passageway 52 into the container.

It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.